Air Quality Permitting
Statement of Basis

December 16, 2005

Permit to Construct No. P-050043

Consolidated Concrete Company, Caldwell
Portable Concrete Batch Plant

Facility ID No. 777-00366

Prepared by:

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AIR QUALITY DIVISION

FINAL

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Acronyms, Units, and Chemical Nomenclatures

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
CO	carbon monoxide
cy/hr	cubic yard per hour
DEQ	Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
HAPs	Hazardous Air Pollutants
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometer
lb/hr	pound per hour
m	meter(s)
MACT	Maximum Achievable Control Technology
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_x	nitrogen oxides
NSPS	New Source Performance Standards
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	Prevention of Significant Deterioration
PTC	permit to construct
Rules	Rules for the Control of Air Pollution in Idaho
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SO_2	sulfur dioxide
T/yr	tons per year
UTM	Universal Transverse Mercator
VOC	volatile organic compound

1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01.200, Rules for the Control of Air Pollution in Idaho, for issuing permits to construct.

2. FACILITY DESCRIPTION

This facility is a portable concrete batch plant with a maximum production rate of 200 cubic yards per hour. The concrete batch plant manufactured by Stephens Manufacturing Company. The components of the plant are as follows: four-compartment aggregate bin, 12 cubic yard (cy) aggregate batcher, two-compartment cement storage silo, and 14 cy cement batcher. The plant combines sand, gravel, cement, and water to produce concrete.

The point source of emissions at the facility is the cement storage silo dust collector.

3. FACILITY / AREA CLASSIFICATION

The facility is portable concrete batch plant. The primary Standard Industrial Classification (SIC) code for the facility is 3273. The Aerometric Information Retrieval System (AIRS) classification is "SM". The AIRS data entry table is provided in Appendix A.

The facility is not subject to Prevention of Significant Deterioration (PSD) requirements, because its potential to emit is less than all applicable PSD major source thresholds: the facility is not a designated facility as defined by IDAPA 58.01.01.006.27; the facility is not major facility, as defined in IDAPA 58.01.01.205; and the facility is also not a Tier I source, as defined in IDAPA 58.01.01.006.102. The facility is not subject to any NSPS, NESHAP, or MACT requirement.

4. APPLICATION SCOPE

Consolidated Concrete Company has submitted a PTC application for a portable concrete batch plant. This permit is the facility's initial permit.

4.1 Application Chronology

August 23, 2005	DEQ receives PTC application from Consolidated Concrete Company for construction a concrete batch plant. Application fees were included in the application.
September 28, 2005	The PTC application was determined complete.
September 13, 2005	Additional information was received from the Consolidated Concrete Company's consultant (Spidell and Associates, a subcontractor for Geodyssey Geological Consultants).
October 12, 2005	An opportunity for public comment started on October 12, 2005, and ended on November 10, 2005. During this period no comments were received.
October 31, 2005	Consolidated Concrete Company requested to review the draft PTC.
November 15, 2005	DEQ provided draft permit to DEQ's Boise Regional Office for review.
November 21, 2005	DEQ provided draft permit to facility for review.
December 16, 2005	Processing fee was received.

5. PERMIT ANALYSIS

This section of the statement of basis describes the regulatory requirements for this PTC action:

Equipment Listing

Table 5.1 contains the equipment listing and the emissions controls.

Table 5.1 EQUIPMENT LISTING AND EMISSIONS CONTROLS

Source Description	Emission Controls
Concrete batch plant Manufacturer: Stephens Model: Not available Maximum Production Rate: 200 cubic yards per hour	Particulate matter emissions from aggregate handling and from vehicles traffic are controlled by reasonable control of fugitive dust.
Cement storage silo	Silo dust collector Manufacturer: Stephens Manufacturing Company Model: SOS-1020 Filtration area: 450 square feet (ft^2) Flow Rate: 2,400 actual cubic feet per minute (ACFM) Cleaning Mechanism: Pulse reverse air PM_{10} control efficiency: 99.99%

5.2 Emissions Inventory

Emissions estimates were provided by Consolidated Concrete Company's consultant, Geodyssey Geological Consultants. The facility's emissions estimates from the concrete batch plant for particulate matter (PM) and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}) are included in Appendix B of this statement of basis. Emissions factors from the concrete batch plant were obtained from U.S. EPA's *Compilation of Air Pollutant Emission Factors*, AP-42, Section 11.12, Concrete Batching, 10/01. Emissions estimates were checked by DEQ staff and were found to be acceptable.

The facility's potential to emit was estimated using the maximum concrete production rate, 200 cubic yard per hour (cy/hr), and full time operations (8,760 hr/yr). Actual emissions will be considerably less because the facility does not operate 8,760 hr/yr. The emissions estimates show that no criteria air pollutant is emitted in an amount that exceeds the major source threshold of 100 T/yr.

Toxic air pollutant (TAPs) and hazardous air pollutants (HAPs) emissions estimates are shown in Appendix B. The emissions estimates shows that emissions of any single HAP is less than 10 T/yr. Emissions of two HAPs or more were estimated to be well below the major source threshold of 25 T/yr for a combination of two HAPs or more.

The emissions estimates presented in Appendix B of this document provided the basis for the PM_{10} emissions incorporated in the permit. They are also provided the basis for the National Ambient Air Quality Standards (NAAQS) analysis and for determining the processing fee assessed in accordance with IDAPA 58.01.01.225.

5.3 Modeling

The permittee supplied (NAAQS) and TAPs ambient impact demonstrations in support of the PTC application. The DEQ's modeling memorandum concerning the review of these ambient impact demonstrations is included in Appendix C of this statement of basis. The results show that the facility has demonstrated compliance with the NAAQS and with IDAPA 58.01.01.585 and 586 to the satisfaction of DEQ. It should be noted that emissions of arsenic and nickel from the silo stack will be inherently limited by limiting the PM_{10} emissions and the cement throughput from the storage silo. The PM_{10} emissions limits and a cement throughput limit are included in Permit Conditions 2.3 and 2.5.

5.4 Regulatory Review

This section describes the regulatory analysis of the applicable air quality rules with respect to this PTC.

IDAPA 58.01.01.201 ..... Permit to Construct Required

Consolidated Concrete Company proposes to construct a portable source that does not qualify for PTC exemption in any of Sections 220 through 223 of the Rules. Therefore, a PTC is required.

IDAPA 58.01.01.203 ..... Permit Requirements for New and Modified Stationary Sources.

Ambient air quality modeling has predicted the facility will not violate the National Ambient Air Quality Standards, and Toxic Air Pollutant increments.

5.5 Permit Conditions Review

Permit Condition 2.3 *Emissions Limits* – establishes the facility potential to emit, 0.263 T/yr PM_{10}. The potential to emit is based on the throughput limit in Permit Condition 2.5, and represents the controlled potential to emit.

Permit Condition 2.4 *Opacity Limit* – this permit condition limits the opacity from any point of emission at the facility to no more than 20% opacity, as required by IDAPA 58.01.01.625.

Permit Condition 2.5 *Throughput Limit* – establishes the cement throughput from the cement storage silo to limit the facility's potential to emit below major source thresholds. The throughput limit was established taking into account the efficiency of the cement storage silo dust collector.

Permit Condition 2.6 *Pressure Drop Monitoring Device* - requires that the permittee install, calibrate, operate, and maintain a pressure drop monitoring device to measure the pressure drop across the dust collector to assure the dust collector is operating within the manufacturer's specifications, thereby minimizing emissions.

Permit Condition 2.7 *Operations and Maintenance Manual* – requires that the permit develop an O&M manual for the dust collector within 60 days of issuance of the permit.

Permit Condition 2.8 *Pressure Drop Across the Dust Collector* – requires that the permittee maintain the pressure drop across the dust collector within O&M manual and the dust collector manufacturer's specifications.

Permit Condition 2.9 *Dust Collector Maintenance and Operation* – requires maintain and operate the dust collector according to the O&M manual and baghouse manufacturer's specifications and recommendations.

Permit Condition 2.10 *Reasonable Control of Fugitive Emissions* – requires reasonable control of fugitive emissions in accordance with IDAPA 58.01.01.650-651.

Permit Condition 2.12 *Throughput Monitoring* – requires the permittee to monitor and record the cement throughput from the cement storage silo monthly and annually to demonstrate compliance with Permit Condition 2.5.

Permit Condition 2.13 *Dust Collector Pressure Drop Monitoring* – requires that the permittee monitor and record the pressure drop across the cement storage silo baghouse once per day when operating.

6. PERMIT FEES

Consolidated Concrete Company paid the PTC application fee on August 23, 2005. In accordance with IDAPA 58.01.01.225 and .226 a PTC processing fee of $1,000.00 is required because the increase of emissions is less than one ton per year. The processing fee was received on December 16, 2005.

Table 6.1 PTC PROCESSING FEE TABLE

Emissions Inventory			
Pollutant	**Annual Emissions Increase (T/yr)**	**Annual Emissions Reduction (T/yr)**	**Annual Emissions Change (T/yr)**
NO_X	0.0	0	0.0
SO_2	0.0	0	0.0
CO	0.0	0	0.0
PM_{10}	0.263	0	0.263
VOC	0.0	0	0.0
TAPS/HAPS	0.003	0	0.003
Total:	0.266	0	**0.266**
Fee Due	**$1,000.00**		

7. PERMIT REVIEW

7.1 Regional Review of Draft Permit

DEQ's Boise Regional Office was provided the draft permit for review on November 15, 2005.

7.2 Facility Review of Draft Permit

The facility was provided the draft permit for review on November 21, 2005.

7.3 Public Comment

An opportunity for public comment period on the PTC application was provided in accordance with IDAPA 58.01.01.209.01.c. from October 12, 2005 through November 10, 2005. During this time, there were no comments on the application and no requests for public comment period on DEQ's proposed action.

8. RECOMMENDATION

Based on review of application materials, and all applicable state and federal rules and regulations, staff recommends that Consolidated Concrete Company be issued final PTC No. P-050043. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD requirements.

Appendix A

Consolidated Concrete Company, Caldwell

P-050043

AIRS Information

AIRS/AFS[a] FACILITY-WIDE CLASSIFICATION[b] DATA ENTRY FORM

Facility Name: Consolidated Concrete Company
Facility Location: Portable
AIRS Number: 777-00366

AIR PROGRAM POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	SM80	TITLE V	AREA CLASSIFICATION A-Attainment U-Unclassified N- Nonattainment
SO_2	B							U
NO_x	B							U
CO	B							U
PM_{10}	SM						SM	U
PT (Particulate)	B							U
VOC	B							U
THAP (Total HAPs)	B							U
			APPLICABLE SUBPART					

[a] Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

[b] AIRS/AFS Classification Codes:

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, or each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.

SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.

B = Actual and potential emissions below all applicable major source thresholds.

C = Class is unknown.

ND = Major source thresholds are not defined (e.g., radionuclides).

Appendix B

Consolidated Concrete Company, Portable

P-050043

Emissions Inventory

Table 1: Material Balance

Raw Material	lb/yrd³	tons/hr
Coarse Aggregate	1866.0	186.50
Sand	1428.0	142.80
Cement	491.0	49.10
Cement Supplement	73.0	7.30
Water (20 gallons)	167.0	16.70
Total	4024	402.40

Emissions estimates are based on a production rate of 200 cy/hr of concrete

$$\frac{402.40\ T}{hr} \left| \frac{yd^3}{4{,}024\ lbs} \right| \frac{2{,}000\ lbs}{1\ Ton} = 200\ yd^3/hr \quad \checkmark$$

$$\frac{(49.10+7.30)\ T}{hr} \left| \frac{8{,}760\ hrs}{yr} \right. = 494{,}064\ T/yr \text{ (throughput)}$$

Table 2: PM and PM10 Emission Estimates

Emission Source	Emission Factors PM lb/yrd³	Emission Factors PM10 lb/yrd³	PM Emissions (lb/hr)	PM Emissions (tons/yr)	PM10 Emissions (lb/hr)	PM10 Emissions (tons/yr)
Aggregate delivery to ground storage	6.40E-03	3.10E-03	1.28	5.61	0.620	2.716
Sand delivery to ground storage	1.50E-03	7.00E-04	0.30	1.31	0.140	0.613
Aggregate transfer to conveyor (2)	6.40E-03	3.10E-03	2.56	11.21	1.240	5.431
Sand transfer to conveyor (2)	1.50E-03	7.00E-04	0.60	2.63	0.280	1.226
Aggregate transfer to storage bins	6.40E-03	3.10E-03	1.28	5.61	0.620	2.716
Sand transfer to storage bins	1.50E-03	7.00E-04	0.30	1.31	0.140	0.613
Cement delivery to silo (controlled)	2.00E-04	1.00E-04	0.04	0.18	0.020	0.088
Cement supplement delivery to silo (controlled)	3.00E-04	2.00E-04	0.08	0.28	0.040 *	0.175 **
Weigh hopper loading	7.90E-03	3.80E-03	1.58	6.92	0.760	3.329
Truck Mix Loading	5.80E-02	1.40E-02	11.60	50.81	2.800	12.264
Total				85.86		29.17

Emission estimates for metals were calculated from emission factors found in AP42 Table 11.12-6. These emission factors are in pounds per ton of material (cement and/or cement supplement). Potential metal emissions are summarized in Table 3.

Table 3: Metal Emissions

Metal	Cement Silo Loading: Emission Factor (lb/ton)	Cement Silo Loading: Emissions (lb/hr)	Cement Silo Loading: Emissions (tons/yr)	Cement Supplement Silo Loading: Emission Factor (lb/ton)	Cement Supplement Silo Loading: Emissions (lb/hr)	Cement Supplement Silo Loading: Emissions (tons/yr)	Truck Mix Batching: Emission Factor (lb/ton)	Truck Mix Batching: Emissions (lb/hr)	Truck Mix Batching: Emissions (tons/yr)	Total Emissions (lb/hr)	Total Emissions (tons/yr)
Arsenic	4.24E-08	2.00E-07	8.12E-07	1.00E-06	7.30E-06	3.20E-05	3.04E-08	1.71E-04	7.51E-04	1.78E-04	7.84E-04
Beryllium	4.88E-10	2.30E-06	1.05E-07	8.04E-06	5.80E-07	2.39E-06	2.44E-07	1.38E-06	6.03E-06	1.44E-06	6.33E-06
Cadmium	4.88E-10	2.30E-08	1.05E-07	1.96E-08	1.43E-07	6.30E-07	3.42E-08	1.93E-08	8.45E-08	2.10E-08	9.19E-08
Chromium	2.80E-08	1.42E-08	6.24E-08	1.22E-06	8.91E-08	3.90E-08	1.14E-08	6.43E-04	2.82E-03	6.53E-04	2.86E-03
Lead	1.08E-08	5.38E-07	2.34E-08	5.20E-07	3.80E-08	1.66E-08	3.80E-08	2.04E-04	8.94E-04	2.08E-04	9.12E-04
Manganese	1.17E-07	5.74E-08	2.52E-06	2.86E-07	1.87E-08	8.18E-08	8.12E-08	3.46E-08	1.51E-02	3.46E-08	1.52E-02
Nickel	4.16E-08	2.06E-06	9.06E-06	2.86E-06	1.86E-06	7.26E-06	1.19E-06	6.47E-04	2.84E-03	6.68E-04	2.93E-03
Phosphorus	1.16E-05	5.79E-04	2.54E-03	3.54E-06	2.58E-05	1.13E-04	3.04E-05	2.17E-03	9.49E-03	2.77E-03	1.21E-02
Selenium	ND	—	—	7.24E-06	5.28E-07	2.31E-06	2.03E-06	1.48E-04	6.47E-04	1.48E-04	6.50E-04

* PM_{10} emissions (controlled):

$$\frac{2.0 \times 10^{-4}\ lb}{yd^3} \left| \frac{200\ yd^3}{hr} \right. = 0.040\ \underline{lbs/hr} \quad \checkmark$$

** $$\frac{0.040\ lbs}{hr} \left| \frac{1\ T}{2{,}000\ lbs} \right| \frac{8{,}760\ hrs}{Yr} = \underline{0.175}\ T/yr \quad \checkmark$$

Appendix C

Consolidated Concrete Company, Portable, Portable

P-050043

Modeling Review

MEMORANDUM

DATE: December 15, 2005

TO: Harbi Elshafei, Permitting Analyst 3, Air Program

FROM: Kevin Schilling, Stationary Source Modeling Coordinator, Air Program

PROJECT NUMBER: P-050043

SUBJECT: Modeling Review for the Consolidated Concrete Co. Permit to Construct Application for their facility near Caldwell, Idaho.

1.0 SUMMARY

Consolidated Concrete Co. (Consolidated) submitted a Permit to Construct (PTC) application for a new concrete batch plant located near Caldwell, Idaho. Air quality analyses involving atmospheric dispersion modeling of emissions associated with the facility were submitted in support of a permit application to demonstrate that the facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02).

A technical review of the submitted air quality analyses was conduced by DEQ. The submitted modeling analyses in combination with DEQ's staff analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that predicted pollutant concentrations from emissions associated with the proposed facility were below significant contribution levels (SCLs); or b) that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all receptor locations. Table 1 presents key assumptions and results that should be considered in the development of the permit.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
DEQ analyses, including fugitive emissions not included in the submitted analyses, indicated the PM10 24-hour National Ambient Air Quality Standard (NAAQS) could be exceeded if reasonable controls are not implemented.	The permit should require reasonable control of process fugitives.
Emission controls were needed to demonstrate compliance with the TAPs Arsenic and Nickel.	As per IDAPA 58.01.01.210.08.c, TAP emission limits are required in the permit if controlled emissions were used in the modeling analyses to demonstrate compliance.

2.0 BACKGROUND INFORMATION

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

2.1.1 Area Classification

The proposed Consolidated facility is located in Canyon County, designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}). There are no Class I areas within 10 kilometers of the facility.

2.1.2 Significant and Full Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources at the facility exceed the significant contribution levels (SCLs) of IDAPA 58.01.01.006.91, then a full impact analysis is necessary to demonstrate compliance with IDAPA 58.01.01.203.02. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the National Ambient Air Quality Standards (NAAQS) listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

Table 2. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Contribution Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Value Used[d]
PM_{10}[e]	Annual	1.0	50[f]	Maximum 1st highest[g]
	24-hour	5.0	150[h]	Maximum 6th highest[i]
Carbon monoxide (CO)	8-hour	500	10,000[j]	Maximum 2nd highest[g]
	1-hour	2,000	40,000[j]	Maximum 2nd highest[g]
Sulfur Dioxide (SO_2)	Annual	1.0	80[f]	Maximum 1st highest[g]
	24-hour	5	365[j]	Maximum 2nd highest[g]
	3-hour	25	1,300[j]	Maximum 2nd highest[g]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[f]	Maximum 1st highest[g]
Lead (Pb)	Quarterly	NA	1.5[h]	Maximum 1st highest[g]

a IDAPA 58.01.01.006.91
b Micrograms per cubic meter
c IDAPA 58.01.01.577 for criteria pollutants
d The maximum 1st highest modeled value is always used for significant impact analysis
e Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
f Never expected to be exceeded in any calendar year
g Concentration at any modeled receptor
h Never expected to be exceeded more than once in any calendar year
i Concentration at any modeled receptor when using five years of meteorological data
j Not to be exceeded more than once per year

2.2 Background Concentrations

Background concentrations were revised for all areas of Idaho by DEQ in March 2003[1]. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Background concentrations used in these analyses are listed in Table 3. Rural/agricultural default values were used for background concentrations. PM_{10} and lead were the only pollutants included in the modeling analyses, since emissions of other criteria pollutants were below modeling applicability thresholds used by DEQ.

1 Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

Table 3. BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)*
PM_{10}	24-hour	73
	annual	26
lead	quarterly	0.03

* Micrograms per cubic meter

3.0 MODELING IMPACT ASSESSMENT

3.1 Modeling Methodology

Table 4 provides a summary of the modeling parameters used in analyses submitted by Consolidated. Geodyssey Geological Consultants (Geodyssey), Consolidated's consultant, performed the air quality analyses.

Table 4. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Additional Description
Model	ISCST3	ISCST3 version 00101. DEQ verification analyses used ISC-PRIME, version 04269
Meteorological data	1987-1991	Boise surface and upper air data
Terrain	Considered	Elevation data from digital elevation model (DEM) files
Building downwash	Considered	The building profile input program (BPIP) was used
Receptor grid	Grid 1	25-meter spacing along boundary out to 100 meters
	Grid 2	50-meter spacing out to 500 meters
	Grid 3	100-meter spacing out to 1000 meters

3.1.1 Modeling protocol

A protocol was not submitted to DEQ prior to submission of the application. However, Geodyssey consulted with DEQ prior to submitting the application to discuss appropriate data and methods, and modeling was generally conducted using methods and data presented in the *State of Idaho Air Quality Modeling Guideline*.

3.1.2 Model Selection

ISCST3 was used by Geodyssey to conduct the ambient air analyses. The current version of ISCST3 was not used in the modeling analyses submitted. DEQ conducted verification analyses using the current version of ISC-PRIME. ISC-PRIME incorporates the PRIME downwash algorithm, which is also used in AERMOD, the recently approved replacement model for ISCST3. The PRIME algorithm is superior to the existing downwash algorithms within ISCST3.

3.1.3 Meteorological Data

Site-specific meteorological data are not available for the proposed facility site in Caldwell. Boise airport is the closest area where model-ready surface meteorological data are available. These data were used in the modeling analyses.

PCRAMMET, the meteorological data preprocessor for ISCST-3, occasionally generates unrealistically low mixing heights as a result of interpolation algorithms used with the twice daily measured mixing heights. DEQ verification modeling was conducted using meteorological data corrected for low mixing heights. All mixing height values below 50 meters were replaced with a value of 50 meters. Meteorological files were not submitted with the application; therefore, it is uncertain whether Geodyssey adjusted the data for low mixing heights.

3.1.4 Terrain Effects.

The modeling analyses submitted considered elevated terrain, with elevations obtained from USGS digital elevation model (DEM) files. Elevations of terrain were not thoroughly reviewed by DEQ since review of a topographic map indicates the area is nearly flat for dispersion modeling purposes, especially considering that maximum impacts are located very near the emission sources.

3.1.5 Facility Layout

DEQ verified proper identification of the facility boundary and buildings on the site by comparing the modeling input to a facility plot plan submitted with the application and aerial photographs of the area.

3.1.6 Building Downwash

Plume downwash effects caused by structures proposed for the facility were accounted for in the modeling analyses. The Building Profile Input Program (BPIP) was used to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters for ISC.

3.1.7 Ambient Air Boundary

The property boundary was used as the ambient air boundary for the modeling analyses submitted by Consolidated. DEQ assumed reasonable measures would be taken to ensure the general public are excluded from access to the property.

3.1.8 Receptor Network

The receptor grids used by Geodyssey met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline*. DEQ determined the receptor grid was adequate to reasonably resolve maximum modeled concentrations.

3.2 Emission Rates

Emissions rates used in the dispersion modeling analyses submitted by the applicant were reviewed against those in the permit application, the engineering technical memorandum, and the proposed permit. The following approach was used for DEQ verification modeling:

All modeled emissions rates were equal to or greater than the facility's emissions calculated in the PTC application or the permitted allowable rate.

More extensive review of modeling parameters selected was conducted when model results for specific sources approached applicable thresholds.

Table 5 lists emissions rates for sources included in the dispersion modeling analyses. Geodyssey did not include all fugitive PM_{10} emissions from material handling operations (sand and aggregate to and from storage piles, and material transfers involving conveyors). DEQ included these uncontrolled emissions, as calculated in the application, in verification modeling analyses. DEQ also modeled these sources assuming an 80% control by best management practices such as wetting materials and wind breaks.

Table 5. MODELED EMISSIONS RATES

Source Id	Description	Emission Rates (lb/hr)[a]			
		PM_{10}[b]	Lead	Arsenic	Nickel
SILODC	Silo dust collector	0.060	4.33E-6	7.51E-6	1.87E-5
NBIN	North aggregate bin	0.380			
SBIN	South aggregate bin	0.380			
TRKMIX	Truck mix	2.80	2.04E-4	1.71E-4	6.71E-4
Fugitive Emissions Sources not Included in Submitted Analyses					
Aggregate delivery to ground storage		0.620			
Sand delivery to ground storage		0.140			
Aggregate transfer to conveyor (2)		1.240			
Sand transfer to conveyor (2)		0.280			
Aggregate transfer to storage bins		0.620			
Sand transfer to storage bins		0.140			
TOTAL		3.04			
TOTAL with 80% control		0.608			

a. Pounds per hour
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers

3.3 Emission Release Parameters

Table 6 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity. Values used in the analyses appeared reasonable and within expected ranges. Additional documentation/verification of these parameters were not required. Process fugitive emissions that were not modeled in the analyses submitted were modeled by DEQ as a single 50 m by 50 m volume source centered amongst the other modeled sources.

Table 6. EMISSIONS AND STACK PARAMETERS

Release Point /Location	Source Type	Stack Height (m)[a]	Modeled Diameter (m)	Stack Gas Temp. (K)[b]	Stack Gas Flow Velocity (m/sec)[c]
SILODC	Point	20.3	1.4	293	0.001
Volume Sources					
Release Point /Location	**Source Type**	**Release Height (m)**	**Initial Horizontal Dispersion Coefficient σ_{y0} (m)**	**Initial Vertical Dispersion Coefficient σ_{z0} (m)**	
NBIN	Volume	4.27	1.98	3.96	
SBIN	Volume	4.27	1.98	3.96	
TRKMIX	Volume	7.62	0.43	8.96	
Fugitive	Volume	2.5	11.6	1.16	

a. Meters
b. Kelvin
c. Meters per second

3.4 Results for Significant and Full Impact Analyses

Results of the significant impact analyses are presented in Table 7. Three different modeling scenarios were assessed: 1) modeling without inclusion of all process fugitive emissions; 2) modeling of all point sources and process fugitives, assuming no emissions controls; 3) modeling of all point sources and process fugitives, assuming 80% control of process fugitives. The difference between PM_{10} results presented in the application and those obtained for the first scenario by DEQ verification analyses is likely a result of differences between the models used. Geodyssey used ISCST3 and DEQ used ISC-PRIME to better assess plume downwash affects caused by structures at the proposed facility.

Table 8 provides results for the full impact analyses. Application of reasonable fugitive emissions controls will assure compliance with PM_{10} NAAQS.

Results from DEQ's lead verification analyses showed different results than those submitted by the applicant. This is likely a result of differing methods used to calculate the quarterly average. Geodyssey modeled a maximum one-hour concentration and then applied a 0.225 persistence factor. DEQ verification analyses used the maximum monthly average as a conservative representation of the quarterly average.

Table 7. PM_{10}[a] RESULTS OF SIGNIFICANT IMPACT ANALYSES

Scenario	Averaging Period	Maximum Modeled Concentration[b] ($\mu g/m^3$)[c]	SCL[d] ($\mu g/m^3$)	Full Impact Analysis Required?
Sources included in submitted modeling analyses – does not include all process fugitives	24-hour	95.0 (99.1)	5.0	Yes
	Annual	(4.85)	1.0	Yes
All sources – assumes no emissions controls for process fugitives	24-hour	193	5.0	Yes
	Annual	5.88	1.0	Yes
All sources – assumes 80% control of fugitives not included in submitted analyses	24-hour	115	5.0	Yes
	Annual	Not Analyzed	1.0	NA

a. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
b. Values in parentheses are those obtained by Geodyssey
c. Micrograms per cubic meter
d. Significant contribution levels

Table 8. RESULTS OF FULL IMPACT ANALYSES

Pollutant	Averaging Period	Maximum Modeled Concentration ($\mu g/m^3$)[a]	Background Concentration ($\mu g/m^3$)	Total Ambient Impact ($\mu g/m^3$)	NAAQS[b] ($\mu g/m^3$)	Percent of NAAQS
PM_{10}[c] emissions as submitted – limited process fugitives	24-hour	39.1 (32.3)	73	112 (105)	150	75 (70)
	Annual	(4.85)	26	(30.9)	50	(62)
PM_{10} all sources – assumes no controls for process fugitives	24-hour	82.0	73	155.0	150	103
	Annual	5.88	26	31.9	50	64
PM_{10} all sources – assumes 80% controls for process fugitives	24-hour	48.8	73	121.8	150	81
lead	quarterly	4.5E-4 (0.015)	0.03	0.030 (0.045)	1.5	2 (3)

a. Micrograms per cubic meter
b. National ambient air quality standards
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

3.5 Results for TAPs Analyses

Compliance with TAP increments were demonstrated by modeling controlled TAP emissions (those TAPs with emissions exceeding the ELs) from the proposed new facility, as per IDAPA 58.01.01.210.08. An emissions limit for arsenic and nickel is needed in the permit, as per IDAPA 58.01.01.210.08.c, since impacts of controlled emissions were used to demonstrate compliance. Table 9 summarizes the ambient TAP analyses.

Table 9. RESULTS OF TAP ANALYSES

TAP	Averaging Period	Maximum Modeled Concentration[a] ($\mu g/m^3$)[b]	AACC ($\mu g/m^3$)	Percent of AACC
Arsenic	Annual	2.25E-4 (2.22E-4)	2.3E-4	98 (97)
Nickel	Annual	8.76E-4 (8.66E-4)	4.2E-3	21 (21)

a. Values in parentheses are modeling results obtained by DEQ verification analyses
b. Micrograms per cubic meter
d. Meters

4.0 CONCLUSIONS

The ambient air impact analysis submitted, in combination with DEQ's verification analyses, demonstrated to DEQ's satisfaction that emissions from the facility will not cause or significantly contribute to a violation of any air quality standard.